

MARSHALL STAR

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March 26, 2009

Landing set for March 28 at Kennedy

Discovery astronauts complete three spacewalks to fully power space station

From combined reports

The International Space Station's fourth and final set of solar array panels have been installed by the space shuttle Discovery astronauts – doubling the electric power available to conduct world-class science research in the laboratory. The panels stretch 240 feet tip to tip.

The STS-119 crew also delivered and installed the S6 truss segment on the starboard, or right, side of the station, which completes the backbone of the space station. The installation signals the readiness of the station to house a six-member crew later this year.

**To read
about STS-119 pilot
Tony Antonelli and
his ties to Marshall,
please see page 6.**

The flight also delivered a replacement distillation assembly for a system that converts urine to potable water.

Shuttle Discovery launched from the Kennedy Space Center, Fla., March 15 on the 13-day mission, which featured three spacewalks to install the truss and deploy the

solar array panels. Landing is scheduled March 28 at the Kennedy Center.

Commander Lee Archambault is leading Discovery's crew of seven, along with pilot Tony Antonelli, and mission specialists Joseph Acaba, John Phillips, Steve Swanson, Richard Arnold and Japan Aerospace Exploration Agency astronaut Koichi Wakata. Wakata replaced space station crew member Sandra Magnus, who has been aboard the station for more than four months. He will return to Earth during the next space station shuttle mission, STS-127, targeted to launch in June. Magnus returns to Earth on shuttle Discovery as a STS-119 crew member.

Spacewalking astronauts conduct first test supporting planetary protection concept

By Janet Anderson

Astronauts working outside the International Space Station March 19 used an innovative laboratory device to detect how biological material may be spread in space. The experiment is a critical step in developing procedures to monitor and mitigate biological

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Jake Maule, principal investigator for the Lab-on-a-Chip Portable Test System, or LOCAD-PTS, swabs a handrail on a solar array bound for the International Space Station.



Greg Chamitoff

Expedition 17, 18 astronaut Greg Chamitoff to visit Marshall

Astronaut Greg Chamitoff, flight engineer and science officer on Expeditions 17 and 18, will visit the Marshall Space Flight Center on April 1. He will present highlights of his six-month stay on the International Space Station in the Huntsville Operations Support Center, Building 4663, Room A164, at 1:15 p.m. All Marshall team members are invited to attend.

Director's Corner

'Déjà vu all over again'

I was in California last year and was delighted to get to talk with some children, but taken aback a little to discover how little they knew about America's space program. In a sense, we live in a "bubble," surrounded by a community that knows and appreciates the value of our space program. However, we are lulling ourselves into a false sense of security if we assume that the level of knowledge and appreciation we enjoy here extends nationwide, particularly among our youth.

One of the biggest challenges we face in terms of program sustainability is figuring out a way to make America's space program relevant to the next generation of Americans. So-called "Matures" and "Boomers" – generations who lived through the Apollo years – by and large get it. They appreciate the value of a robust space exploration program and don't mind spending .6% of their tax dollar to pay for it. But it's not a slam dunk with succeeding generations. And given the downward trend of interest in math, science and engineering, the growth of entitlements and the onerous debt we're transferring to them even as we speak, the odds aren't entirely in our favor. Perhaps

the only thing that has cut through the clutter of the three-second sound bites that dominates our reality-show world is the bad news about Challenger and Columbia.

Capturing the hearts and minds of America's youth is a long-term sustainability issue for America's space program. We need to find that "wow" factor – something that captures and holds their attention – and we need to keep their attention with successes.

Of course, there may be a groundswell of nationalistic pride when a country like China, India or Brazil makes a serious bid for the moon. If that happens, we may see a modern version of the space race of the sixties. However, for the sake of sustainability, our purpose needs to be more than a desire to beat someone else to the moon. Our purpose needs to be to build a sustainable capability for the nation not unlike our interstate highway system, our transcontinental railroad and our airline infrastructure. Our purpose needs to be to build a space exploration capability that will be a long-term asset for the nation, and we need to be able to convince taxpayers that capability is of lasting, strategic importance to our country.

If we can't do that, we may find



ourselves ten to fifteen years down the road with the biggest and best rockets in the world with little public support for a space exploration program – and, as Yogi Berra put it, it may be "déjà vu all over again."

A stylized, handwritten signature in black ink that reads "Dave". The signature is fluid and cursive, with a long horizontal stroke extending from the end.

Dave King
Marshall Center Director

Earth Day T-shirts are on sale now

This year's Earth Day T-shirts are on sale now. The T-shirts will be available for purchase at the NASA Exchange Space Shop in Building 4203. Orders must be

turned in by close of business April 8.

For an order form, visit http://inside.msfc.nasa.gov/announcements/earthday-t_orderform.pdf, or contact Teresa Carathers at 544-3293.



THE FACE OF MISSION SUCCESS IS:

Cynthia Frost
Nodes flight operations lead



- **Organization:** International Space Station Vehicle Office in the Science & Mission Systems Office
- **Joined NASA:** 1990
- **Education:** Bachelor's degree in mechanical engineering, University of Alabama in Huntsville, 1984
- **Responsibilities:** Before launch, I ensure that all hardware needed to activate and operate the Nodes – the interconnecting elements between various pressurized modules on the International Space Station – is available in orbit when needed. Once we launch, I sit on-console in the Mission Engineering Room at the Johnson Space Center in Houston, to make sure the correct subsystems are available to support in-orbit tasks or anomalies.
- **What do you feel is one of the coolest science experiments for the International Space Station?** I love experiments that grow things, such as plants and crystals. It's interesting to see the differences between growth on the ground and in microgravity.
- **What would people be surprised to find out about you?** I am a NASCAR fan. My favorite drivers are Greg Biffle and Carl Edwards.

LOCAD *Continued from page 1*

contamination in future missions to other worlds.

The successful spacewalk was the first-ever such use of the Lab-on-a-Chip Portable Test System, or LOCAD-PTS. The portable testing and analysis device, used on the space station since March 2007, is designed to rapidly detect and identify a variety of biological materials derived from various bacteria and fungi.

Before STS-119 mission specialists Steve Swanson and Richard Arnold exited the space station airlock to install the orbiting facility's new solar arrays, astronaut Sandy Magnus swabbed their spacesuit gloves. The procedure was repeated when the astronauts returned to the space station.

The crew is analyzing the results using LOCAD-PTS, and will provide results in coming days.

"This simple approach, designed to monitor the spread of biological material in space, takes very little crew time to perform and could prove to be a useful step in planning future human missions to the moon and Mars," said Dr. Jake Maule of BAE Systems in Rockville, Md. Maule is principal investigator for the LOCAD-PTS Exploration team.

As the spacewalkers worked, they came into contact with surfaces of the solar array truss segment, which were sampled and analyzed with LOCAD-PTS prior to their launch to space March 15 on space shuttle Discovery. While most surfaces of the hardware were clean before launch, slightly elevated levels of fungi were detected, particularly in the fabric gap spanners -- safety elements that literally span the gap between handrails, helping the crew move around the exterior of the space station as they work.

The suit gloves of Swanson and

Arnold functioned as "swab" devices, picking up any bacteria or fungi, dead or alive, that remained on the gap spanners or other surfaces. Studying those samples will permit the LOCAD-PTS Exploration team to track biological materials before and after their journey from Earth to space.

Such measures will help development of a key capability for future human expeditions to the moon and Mars, said Mike Effinger, project manager for LOCAD at the Marshall Space Flight Center, which leads the research. Its end goal: to establish procedures and create tools to monitor and restrict the spread of biological material on the moon and other worlds.

"Because spaceflight currently is limited to low Earth orbit, requirements don't exist yet in regard to biological contamination of other planetary surfaces by human missions," Effinger said. "This study seeks to begin development of test procedures that can be further developed on the moon in preparation for the human exploration of Mars."

The compact LOCAD-PTS device, which incorporates interchangeable cartridges, is designed to serve as a mobile laboratory requiring minimal resources. The handheld unit weighs just 2 pounds. It is driven by technology developed by Charles River Laboratories of Wilmington, Mass., and modified for spaceflight by NASA researchers at the Marshall Center.

The LOCAD-PTS Exploration experiment is funded by the NASA Science Mission Directorate's Moon and Mars Analog Mission Activities Program at NASA Headquarters in Washington.

Anderson is a public affairs officer in the Office of Strategic Analysis & Communications.

40 years ago

Apollo 9 paved the way for Apollo 10, 11

Forty years ago this summer, humans first walked on the moon. NASA launched Apollo 11 in July 1969, and thereby successfully answered President John F. Kennedy's 1961 challenge to Americans to land humans on the moon before the end of the decade.

This year includes the 40th anniversaries of Apollo 9 on March 3, Apollo 10 on May 18, Apollo 11 on July 16, and Apollo 12 on Nov. 14. All the missions relied on the Saturn V launch vehicle developed by the Marshall Space Flight Center and its industry partners to carry the Apollo astronauts into space.

Apollo 9 was delayed by one of the most ancient and difficult-to-treat afflictions known to humans – the common cold. By Sunday, March 2, doctors said the colds had cleared.

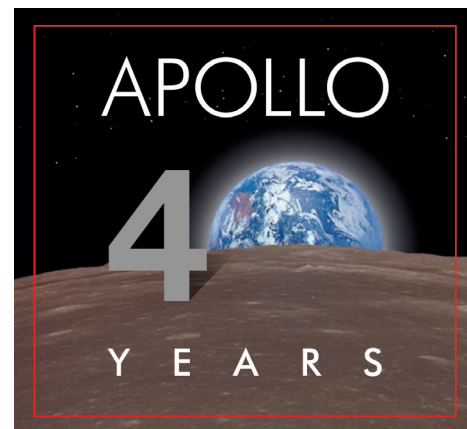
On March 3, 1969, at 10 a.m. CST, NASA launched Apollo 9 astronauts James A. McDivitt, David R. Scott and Russell Schweickart, on board a Saturn

V that lifted off from Launch Complex 39A at the Kennedy Space Center, Fla.

During the mission, there was some evidence that the after effects of their colds lingered. Launch officials feared that Schweickart's extravehicular activity might be canceled because of the astronaut's nausea, but the exercise went off almost as scheduled. Although lunar module pilot Schweickart continued to be bothered by physical troubles – nausea and vomiting – the Apollo 9 crew quickly caught up with their flight plan and went on to do almost all of the activities scheduled for the mission.

During a critical rendezvous and docking maneuver, the command/service module and the lunar module ranged as much as 100 miles apart. This was the first exercise of this type performed in the space program and was the method selected for the lunar landing later that year. Early in the flight, McDivitt and Schweickart checked out the lunar module. Schweickart also ventured out of the lunar module on the fourth day for a "tour" of the outside of the craft and a picture-taking session.

During the first four days of the mission, the Apollo 9 crew spent its time doing landmark tracking exercises, spacecraft systems exercises and taking pictures in a multi-spectral terrain photography experiment for Earth resources studies. Following the mission, officials said that NASA achieved the majority of its activities with the



successful rendezvous and docking of the spacecraft and the lunar module during the fifth day of flight.

An early evaluation of flight data indicated that the Saturn V launch vehicle that hurled the Apollo 9 crew into orbit performed very much as expected. It was the fourth flight of the nation's most powerful rocket, the last two of which were manned.

The hardware of Apollo 9 – the command/service module and the untried-in-space lunar module – were successfully maneuvered, undocked, re-docked and jettisoned with almost perfect precision during the mission's first five days. The mission lasted exactly 241 hours and one minute,

See Apollo 9 on page 5



The launch of the Apollo 9 on March 3, 1969.



From left, Apollo 9 astronauts James A. McDivitt, David R. Scott and Russell L. Schweickart pause in front of the Apollo/Saturn V space vehicle.

Apollo 9 *Continued from page 4*

delayed over two hours by changes to the flight plan that were made during the mission. The command module and its main parachutes were clearly visible as they descended toward the calmness of the recovery zone. The spacecraft hit the water about three miles from the recovery ship, U.S.S. Guadalcanal, at exactly 11:01 a.m.

Television viewers saw a "TV first" as the three astronauts stepped from their 10-day home and leapt into rubber life rafts inflated and placed by Navy frogmen. Scott was first, Schweickart was second and spacecraft commander McDivitt was last to emerge. A gust of wind under one raft tipped it over on top of Schweickart as he made his way from one raft to another, but no damage was done. Wash from the rescue helicopter's rotors made several passes necessary before the first, and then the other crew members were successfully hoisted aboard the hovering craft.

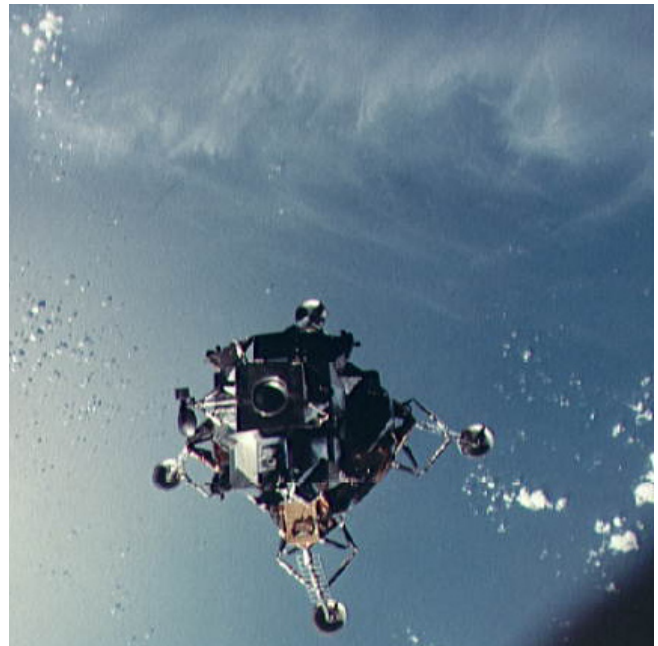
Astronauts McDivitt, Scott and Schweickart spent almost one full day aboard their recovery ship, before being flown to Ellington Air Force Base near Houston for a reunion with their families, while NASA studied plans for Apollo 10, Apollo 11 and Apollo 12, all in 1969.



Astronaut Russell Schweickart works inside the command module.



Astronaut James A. McDivitt, Apollo 9 commander, shown inside the command module.



View of the Apollo 9 lunar module on the fifth day of the mission.

Marshall team has strong ties with Discovery's pilot

Astronaut Tony Antonelli was propulsion rep for Astronaut Office

By Sanda Martel

"The Shuttle Propulsion Office is excited about each space shuttle launch and mission," said Steve Cash, manager of the Shuttle Propulsion Office at the Marshall Space Flight Center. "For STS-119, we are especially excited that astronaut and mission pilot Tony Antonelli, one of our colleagues, is a crew member on this important mission."

Antonelli launched aboard space shuttle Discovery on March 15 from the Kennedy Space Center, Fla., for a 13-day mission to the International Space Station.

Commander Lee Archambault is leading the STS-119 mission, along with pilot Antonelli and mission specialists Joseph Acaba, Steve Swanson, Richard Arnold, John Phillips and Japan Aerospace Exploration Agency astronaut Koichi Wakata. At Marshall Star press time, landing was scheduled for March 28 at the Kennedy Center.

Four days into the mission, on March 18, Antonelli called the Shuttle Propulsion Office from the space station. He said he wanted to thank the Marshall team for their hard work, and for giving him and his crew a safe ride into space.

"That's just the kind of personable guy Tony is," said John Chapman, manager of the External Tank Project Office. "It was such a nice thing for him to do. Imagine being on this important mission and finding time to call to let us know he cares about our dedication to safe spaceflight."

In that phone call, Antonelli said, it was "incredibly exciting" to experience weightlessness and view Earth aboard the space station. STS-119 is Antonelli's first mission into space.

Antonelli, a U.S. Navy commander and F/A-18 pilot, was selected as a shuttle

pilot by NASA in July 2000 and has served in various technical assignments at Johnson Space Center's Astronaut Office in Houston.

In early 2002, he became the astronaut crew representative for shuttle propulsion. In that capacity, Antonelli often traveled to the Marshall Center and shuttle propulsion contractor facilities to attend hardware design and acceptance reviews and other meetings. He served in that position until 2006, when he began crew training for the STS-119 mission.

Scotty Sparks, deputy chief engineer for the External Tank Project, recalled Antonelli's participation in numerous external tank engineering meetings and review boards during and after the Columbia accident investigation beginning in 2003.

"Tony served as a sounding board for solutions to problems identified in the investigation," Sparks said. "He meant so much to our team. He was alongside us during those months of difficult and long hours when we were determining what had to be corrected and how we were going to do it."

"Like us, Tony took ownership of the hardware and was right there with us in the trenches," Sparks added. "It was much appreciated by the team. We are all proud to have been associated with him."

"Tony is an absolutely fantastic guy," Chapman said. "He would sometimes jump in a T-38 plane in Houston and fly over to the Michoud Assembly Facility in the evening just to visit and encourage



Tony Antonelli visits with NASA and Lockheed Martin workers at NASA's Michoud Assembly Facility in New Orleans on Family Day in June 2008. One element of the space shuttle external tank, the hydrogen tank, provides an imposing backdrop in Building 103, a Michoud welding facility.

the production workers on the second shift." Lockheed Martin workers build space shuttle external tanks at NASA's Michoud Facility in New Orleans.

"He brought his family over to Michoud for the employee family day last summer and they spent the entire morning meeting and greeting employees and signing autographs," Chapman added.

Phillip Benefield, systems and requirements team lead for the Space Shuttle Main Engine Project Office, recalled that Antonelli was "very interested in learning about the space shuttle main engine and the work the project office does."

"I recall sitting down with Tony and going through an engine schematic and describing to him how the engine operates, the major components and

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Classified Ads

To submit a classified ad to the Marshall Star, go to Inside Marshall, to "Employee Resources," and click on "Employee Ads — Submit Ad." Ads are limited to 15 words, including contact numbers. No sales pitches. Deadline for the next issue, April 2, is 4:30 p.m. Thursday, March 26.

Miscellaneous

Macintosh software, version 9 Adobe Photoshop, InDesign, Adobe GoLive, MS Office, \$125. 778-8893 evenings

Firewood, \$80 per truckload. 755-0050

Broyhill plaid loveseat, \$100. 348-1809

Borla Stinger axle-back mufflers for 2005 Mustang GT, \$300. 616-2485

Kenwood 440SAT HF amateur radio, matching power supply, mic, antenna, \$450 obo. 656-2951

Gateway Desktop PC, XP Pro, Office, 80-GB Hard Drive, CD/DVD drives, 18-inch CRT, \$150. 313-655-7966

Miniature Yorkie, 1 year old, \$300. 783-3604

Peg Perego Prima Pappa High Chair, \$85; Pliko stroller, Viaggio car seat/base, \$150. 426-4769

Two leather couches, maroon, \$400 each/\$750 both. 281-957-5295

Treadmill, \$250. 684-6006

Wedding dress, \$600; stepper exerciser, \$50; water fountain, \$300. 651-4723

Jack Russell Terrier puppies, 9 weeks old, shots are current, \$125. 656-1050

2002 Sears upright freezer, 13.7 cubic feet, frost free; three barstools, wood, back, swivel. 830-2047

Paradigm stereo speakers, Studio 20 Reference Series, built-in amplifiers, gamers or audiophiles, \$725 pair. 352-514-8405

Murray 40-inch 12.5 HP riding lawn mower, \$475 obo. 656-2557

Two Citizen Eco Drive watches, \$125, perpetual calendar, \$275; Honda 5.5HP lawnmower, 22 inches, \$100. 883-5168

Bedroom suite, antique, full size, light oak, five pieces, \$1,200. 479-4554

Pitching machine, \$1,175. 464-9408

Baby girl items, 0-9 months clothing, cradle swing, car seat, bouncer. 874-6241

Drapes, two pairs, custom, lined, off white, 53Wx82L, 84Wx82L, rods, \$200. 683-3398

Stackable washer and electric dryer, \$300. 205-522-7028

Samsung Glyde touch-screen cell phone, \$80. 975-2034

Prom dresses, black/purple, size 5-6; blue/white, size 7-8, \$80 each. 520-1807

Couch, love seat, \$225; table, chairs, \$100; entertainment center, \$35; more. 461-7520

Vehicles

2008 Fisher Pontoon boat, 18 feet, 50HP Mercury Four Stroke, low hours, 13,500. 505-9263

2007 Yamaha R-1 street bike, candy red, 1000cc, 1,300 miles, \$8,000 firm. 468-7265

2006 Dodge Magnum SRT8, 425HP, silver, loaded, leather, navigation, Sirius, Bluetooth, 24k miles, \$25,900. 503-5919

2005 8'x16'V-Nose Horton Hauler enclosed trailer, 7-foot ceiling, aluminum wheels, brakes, custom shelves. 683-2040

2004 R-Vision 33-foot Class-A Motorhome, slide, workhorse

chassis, extended warranty, www.thewillettfamily.com/rv, \$56,000. 883-7021

2003 Chevrolet Astro cargo van, white, 165k miles, \$3,900. 990-3954 or 457-6294

2001 Saturn L200, 4-cylinder, automatic, sunroof, leather, 30mpg, 146k miles, \$2,500. 420-2444

2001 Honda Odyssey minivan, silver, rebuilt transmission, 164,600 miles. 880-2290

2001 Infiniti QX4, front/side airbags, 4WD high/low, fully loaded, 123k miles, \$7,900. 489-7706

1997 Porsche Boxster, black, five-speed, high miles, \$11,000 obo. 837-2162, 652-2875 or 694-5911

1997 Lincoln Town Car Signature Series, 67k miles, \$4,400. 679-0934

1997 Ford Explorer XLT, 4.0 SOHC engine, leather, running boards, new tires, 203k miles, \$2,800. 837-7193

1996 Nissan Pathfinder LE, all power, 2WD, sunroof, 197k miles, \$4,500 negotiable. 709-0976

Wanted

Small kitchen table with chairs; 27-inch TV. 883-2757

Houses to clean; elderly or children sitting in Madison, Huntsville, Monrovia. 651-4723

Houses/offices to clean, available evenings/weekends. 777-8595 leave message

King/queen mattress, yard tools, washer/dryer set, grass-seed spreader, patio furniture. 720-352-4038

Used riding lawn mower, 42-inch cut or smaller. 468-5375

Found

Short, red-handled screwdriver, in front of Building 4200 post office; gold bracelet, north entry of Building 4200. 544-4680

Antonelli *Continued from page 6*

primary flow paths," Benefield said. "He was very interested and engaged."

Craig Sumner, United Space Alliance chief engineer supporting shuttle propulsion, said Antonelli has been an outstanding team member and contributor. "He has inspired all of us with his enthusiasm and passion for spaceflight."

"During our reviews, Tony challenged team members to do their homework and leave no stone unturned," Sumner

said. "He led by example and regularly asked penetrating technical questions. When a response fell short, he would re-engage to arrive at the best answer."

"Tony is also passionate about his family, and for all his professional accomplishments, his family is his proudest achievement of all," Sumner said. Antonelli is married and the father of two children.

David Beaman, manager of the Reusable Solid Rocket Booster Project Office, said Antonelli also was an integral part of the

booster team. "He not only served as our project astronaut, but in the process built friendships with our team members."

For more information about the STS-119 mission, visit http://www.nasa.gov/mission_pages/shuttle/main/index.html.

For a bio on Tony Antonelli, visit <http://www.jsc.nasa.gov/Bios/htmlbios/antonelli-da.html>.

Martel, an ASRI employee, supports the Office of Strategic Analysis & Communications.

Final hardware for test of Ares I-X rocket arrives in Florida



The final pieces of the Ares I-X rocket arrived at NASA's Kennedy Space Center in Florida on March 19. The first stage uses four reusable motor segments, manufactured by the Ares I-X first stage prime contractor Alliant Techsystems Inc., or ATK, of Promontory, Utah. The segments departed Utah on March 13 for the seven-day, cross-country trip to Florida.

Obituaries

Vernon Caillouet, 90, of Florence died Oct. 29, 2008. He retired from the Marshall Center in 1980 as an aerospace engineering technician.

Frank S. Boardman, 82, of Huntsville died Feb. 24. He retired from the Marshall Center in 1997 as an aerospace engineer supervisor. He is survived by his wife, Flora Sarinopoulos Boardman.

Eli Erskine Nelson, 85, of Athens died Feb. 24. He retired from the Marshall Center in 1982 as an engineer. He is survived by his wife, Julia Hatchett Nelson.

Harry I. Thayer, 92, of Huntsville died Feb. 26. He retired from the Marshall Center in 1982 as an aerospace engineering technician.

C.B. Dollins, 97, of Oklahoma City, Okla., died March 2. He retired from the Marshall Center in 1972 as an engineer.

Eugene J. Buhmann, 78, of Huntsville died March 3. He retired from the Marshall Center in 1981 as an aerospace engineering supervisor. He is survived by his wife, Renee Buhmann.

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